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THE DIFFERENCE OF LEARNING ACHIEVEMENT USING COOPERATIVE LEARNING MODEL APPLIED ON THE GRADE VIII STUDENTS OF SMP NEGERI 1 KOLAKA

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Abstract

The design of this research was experiment and aimed to know whether there was difference of learning result of mathematics between students taught by using cooperative learning model type TSTS, NHT, and STAD. The population in this study was all students of class VIII SMP Negeri 1 Kolaka academic year 2015/2016 while the sample taken was by Cluster Random Sampling technique. Techniques of collecting data used test and observation technique. To get a representative test, the validity and reliability test were conducted. The data obtained were analyzed using normality test, homogeneity test, and One Way Anova test. From the analysis result, it was found that the initial analysis for normality test at 5% level (n = 26) obtained D_{tabel} = 0,264 while D_{count} = 0.0975 (experiment class I) D_{count} = 0.1668 (experiment class II) and D_{count} = 0.1451 (control class), Because $D_{count} < D_{table}$ then H0 was accepted so the data was normally distributed. For homogeneity test at 5% level (n = 78) obtained F (0.05, 2, 75) = 3.12 and L = 2.364 Since $L < F_{table}$ then H0 was accepted so the data was homogeneous. With One Way Anova test obtained F_{count} = 13.427 and at 5% level obtained (2:75) F_{table} = 3.12 for $F_{count} > F_{table}$ then H1 was accepted so there were differences in learning outcomes between students taught using cooperative learning model type TSTS, NHT and STAD. Since H1 was accepted then a further test was conducted using scheffe t test. At level of 5% (dk = 50) obtained t_{table} = 2.0085 and t_{count} = 5.181. Because $t_{count} > t_{table}$ then H1 was accepted so the mean result of students' mathematics learning taught by model of cooperative learning type TSTS was better than mean result of cooperative learning type STAD. At 5% level (df = 50) obtained t_{table} = 2.0085 and t_{count} = 2.6429. Because $t_{count} > t_{table}$ then H1 was accepted so the mean result of students' mathematics learning taught by model of cooperative learning type NHT was better than cooperative learning type STAD. At level 5% (df = 50) obtained t_{table} = 2.0085 and t_{count} = 2.5387. Because $t_{count} > t_{table}$ then H1 was accepted so the mean result of students' mathematics learning which was taught by cooperative learning model of TSTS type was better than mean of mathematics learning result of student taught by NHT type.

Keywords: *mathematics learning model, two stay two stray, numbered head together, student teams achievement and divisions, cooperative learning*

A. Introduction

Mathematics as a science has a very important role in life. Many mathematical concepts are needed to solve problems in everyday life, as well as to help to solve economic, social, scientific, and technological problems so that mathematics learning in schools is expected to shape

students' understanding and skills in relating mathematics with other sciences and day-to- day life. Mathematics learning in schools is a priority in educational development. In the Education Unit Level Curriculum (KTSP) 2006, it is stated that mathematics courses should be given to all students since primary school to equip students in improving logical, analytical, systematic, critical and creative thinking skills, as well as the ability to work together. These competencies are needed so that students can have the ability to acquire, manage, and utilize information to survive in an ever-changing, uncertain, and competitive state. (Depdiknas, 2006: 10).

Based on observations with mathematics teacher of class VIII at SMP Negeri 1 Kolaka on January 8, 2016, indicated that math lesson is still one of the subjects considered difficult and tend not favored by most students. In addition, there are still many teachers who use conventional learning models using lecture methods. The teacher as the information center explains the material and the students sit listening and recording the material delivered by the teacher, so the students become passive and not creative, because there is no opportunity to discuss both with teachers and fellow students. Conventional learning model causes the achievement of student's mathematics learning outcomes is still low, the previous student learning outcomes of mathematics subjects that have a minimum completeness criteria that is equal to 72 and learned completeness there are still some students who get value under the Minimum Achievement Criterion (KKM). This means that there is still a need to improve the way the teacher learns.

Based on field facts, the results study of the 2011 Trends In International Mathematics Science Study (TIMSS) for grade VIII students ranked Indonesia in 36 out of 48 countries, and the 2012 Program for International Student Assessment (PISA) outcomes for Grade VIII students ranked Indonesia 64 out of 65 countries. This fact shows that on an international scale, students' mathematics achievement at SMP grade VIII is still very low and not yet optimal. Currently, there are various models of learning in KTSP in 2006 with various advantages, including models are direct learning, cooperative learning model, and problem-based learning model. Researchers believe that cooperative learning model can improve students' mathematics learning outcomes. This is possible because the cooperative learning model emphasizes the students' awareness of the need to learn to apply knowledge, concepts, skills to students in need or other members of the group, so that cooperative learning can be mutually beneficial among underachieving students and high achieving students.

At present, there are many types of cooperative learning models that can be applied in classes in an effort to improve mathematics learning outcomes such as Two Stay Two Stray (TSTS) cooperative learning model, Number Heads Together (NHT) type and Student Teams Achievement Division (STAD). The Two Stay Two Stray cooperative learning model (TSTS) is a model that provides an opportunity for the group to share results and information with other groups. In this model the students are exposed to the listening activities of what their friends say when they are visiting, which indirectly the students will be brought to listen to what the group members of the host group are saying, so that in this process will happen listening activity of the material to the students. Therefore, cooperative learning model TSTS type aims to work together in mastering a concept so that it can lead students to be active, both in discussion, question and answer, seeking answers, explaining, and also listening to the material described by friends.

The cooperative learning model of type Heads Together (NHT) is one type of cooperative learning that emphasizes special structures designed to influence the interaction patterns of students and has a goal to improve academic mastery. The benefits of cooperative learning of Numbered Head Together (NHT) types that students will be more confident, appreciative of individuals, motivated, and learning outcomes will be better.

Another learning model that can improve student learning outcomes is STAD type cooperative learning model (Student Team Achievement Divisions). STAD type cooperative learning model is one of the motivational learning models that are believed to be able to increase the motivation and students' learning outcomes. This model can be used as an alternative to create a varied condition in the learning activities, can help teachers to solve problems in learning, such as the low interest in students' learning, and the low activity of students' learning process.

Based on these descriptions and problems that arise in the process of mathematics learning, researchers conduct research activities using cooperative learning model type TSTS, NHT, and STAD to improve student learning outcomes.

B. Literature Review

Mathematics Learning Outcomes

Learning outcomes are an important element in learning activities. (Slameto, 2010: 7) says that the results of learning mathematics is a process of learning mathematics that has been achieved, the extent to which achieved, good or less, depending on what is done in the process.

The result of mathematics learning is an achievement through the process of learning mathematics (Slameto, 2010: 7). In mathematics lessons the results of mathematics learning can be assessed by using tests. The main test is measuring the learning outcomes achieved by a person learning mathematics, and the level of understanding of the material that has been studied because the tests used in the assessment can be diagnostic, formative, and summative.

Thus, the test of learning outcomes is a set of task questions that must be answered or completed by the student with the aim of measuring students' learning progress. From the definition of the test then the results obtained by students can be determined by the existence of tests performed or given.

Type *Two Stay Two Stray* (TSTS)

One of the cooperative learning models developed by Spencer Kagan is the cooperative learning model of TSTS type. The structure of the TSTS is one type of cooperative learning that provides an opportunity for the group to share results and information with other groups. According to Shoimin (2014: 222), the cooperative learning model of TSTS is two students living in groups and two students visiting another group. Two people who live in charge of providing information to guests about the results of the group, while the visitors in charge of recording the results of the group discussions visited.

In groups as usual; 2) After completion, two students from each group will leave the group and each visit another group; 3) Two students living in the group are assigned to share their work and information about them; 4) Guests excuse themselves and return to their own groups and report their findings from other groups; 5) Groups match and discuss the results of their work..

Type *Numbered Head Together* (NHT)

The NHT type cooperative learning model is a variant of group discussion with its own characteristic is that the teacher only designates a student representing his group, without informing who represents his or her group. This guarantees the total involvement of all students so it is best to increase individual responsibility in group discussions. According to Lie (2003: 59), this method was developed by Spencer Kagan by involving the students in reviewing the materials covered in a lesson and examining their understanding of the content of the lesson.

In this lesson, each group member must know the answers the group generates and have equal opportunities and responsibilities in trying to answer the questions. Instead, they ask questions to the whole class, the teacher uses a four-step structure: 1) Numbering, the teacher divides the students into groups or teams of three to five and assigns them a number so that each student in the team has a different number; 2) Asking questions, teachers ask questions to the students. Questions may vary, from the specific to the general; 3) Thinking together, students think together to describe and assure that everyone knows the answer; 4) Giving answers, the teacher mentions a number and the students from each group with the same number raised their hands and prepared the answers for the whole class.

Type *Student Teams Achievement and Divisions* (STAD)

According Trianto (2007: 52), type STAD is one type of cooperative learning method by using small groups with the number of members of each group of 4-5 students in a heterogeneous. STAD is a cooperative learning model that gives the team a plurality of exercises to learn concepts and skills. Meanwhile, according to Suyatno (Supratman) 2014: 49) suggests that, STAD type is a cooperative learning model for grouping mixed ability that involves team recognition and group responsibility for individual member learning.

Based on the description, it can be concluded that STAD type cooperative learning model is a way of learning by forming small groups, where students are grouped into several groups consisting of 4-5 people, with mixed ability and group responsibility for individual learning members in achieving learning objectives which are expected. According to Aqib (2013: 20), STAD cooperative learning model steps are as follows: 1) Establish groups of 4-5 people

heterogeneously (mix by achievement, gender, ethnicity, etc); 2) The teacher presents lessons; 3) The teacher assigns a task to the group to be done by members of the group. The members know to explain to the other members until all the members in the other group understand; 4) Teacher gives quiz or question to all students. When answering a quiz, they cannot help each other; 5) Evaluate; 6) Conclusion.

C. Methodology

This research is an experimental research with Posttest-Only Control Group design that uses one way anova analysis. The research design will be described as follows: (Samad, 2014: 47).

R	X_1	$O2_1$
R	X_2	$O2_2$
R		O4

Explanation:
R : Random
X_1 : Treatment for experimental group I
X_2 : Treatment for experimental group II
$O2_1$: Students' Learning Outcomes of the experimental group I after Treatment
$O2_2$: Students' Learning Outcomes of the experimental group II after Treatment
O4 : Students' Learning Outcomes of the controlgroup after Treatment.

The population in this research is all students of class VIII SMP Negeri 1 Kolaka in second semester of academic year 2015/2016 consisting of 9 classes. The sample in this study used cluster random sampling to determine which class is used as research sample class (sukardi, 2003). First, take the daily value of odd semester semester of class VIII students then tested data normality and homogeneity test data, nine classes were randomly assigned to obtain the expression class and control class, so that the samples obtained in this study were VIIID class for experimental class (TSTS), Class VIIIF for experimental class (NHT), and class VIIIH for control class (STAD).

Data in this study is quantitative data in the form of interval data obtained from the results of student learning mathematics. Data collection techniques in this study were conducted by giving the test. This test is in the form of a description test that is given after the learning (posttest) on the expression class and control class. Indicator of mathematics learning outcomes of students used in this study is to calculate the circumference and area of the circle. The research instrument used is the test of mathematics learning results in the form of description test and the data obtained then analyzed descriptively and inferensial.

D. Result and Discussion

Result

Descriptive Analysis of the Students' Mathematics Learning Outcomes

The analysis of students' mathematics learning outcomes is intended to provide a description of the characteristics to see the differences in cooperative learning model TSTS type, cooperative type NHT, and cooperative STAD type which can be seen through mean, standard deviation and variance.

Table 1. Results of Descriptive Analysis of Students' Mathematics Learning Outcomes with Cooperative Learning Model TSTS, NHT, and STAD.

Students' Mathematics Learning Outcomes	
Descriptive Analysis	**Cooperative Learning Model**
N	78
Mean	**76,0513**
Std. Deviation	**12,25052**
Variance	**150,075**
Minimum	34,00
Maximum	95.00

Based on the descriptive analysis of mathematics learning outcomes of students who were taught by cooperative learning model in table 1, obtained mean value of 76.0513, variance 150.075, and standard deviation 12.25052.

Descriptive analysis when done in group by experiment class 1 with type of TSTS and control class with STAD type can be seen that class which is taught by cooperative learning type TSTS have average result of higher mathematics learning that is equal to 83.6538 compared with control class taught with using STAD type cooperative learning model of 68.3462. The results can be seen in table 2 below.

Table 2. Results of Descriptive Analysis of Students' Mathematics Learning Outcomes for Experimental Group 1 and Control Group

Students' Mathematics Learning Outcomes		
Descriptive Analysis	**TSTS**	**STAD**
N	26	26
Mean	**83,6538**	**68,3462**
Std. Deviation	8,07932	13,66731
Variance	65,275	186,795
Minimum	67,00	34,00
Maximum	95,00	95,00

Based on descriptive analysis of mathematics learning outcomes of students conducted in groups between experimental class 2 with type NHT and control class with STAD type can be seen that the class that is taught by cooperative learning model type NHT has average learning result of higher mathematics that is equal to 76.1538 compared with Control class taught by using STAD type cooperative learning model of 68.3462. The results can be seen in table 3 below.

Table 3. Results of Descriptive Analysis of Students' Mathematics Learning Outcomes for Experimental Group 2 and Control Group

Students' Mathematics Learning Outcomes		
Descriptive Analysis	**NHT**	**STAD**
N	26	26
Mean	**76,1538**	**68,3462**
Std. Deviation	9,39656	13,66731
Variance	88,295	186,795
Minimum	60,00	34,00
Maximum	90,00	95,00

Based on descriptive analysis of students' mathematics learning outcomes conducted in groups between experimental class 1 with TSTS type and experimental class 2 with NHT type it can be seen that the class taught by cooperative learning model of TSTS type has average of higher learning achievement that is 83.6538 Compared with the classes taught using the NHT type cooperative learning model of 76.1538. The results can be seen in table 4 below.

Table 4. Results of Descriptive Analysis of Students' Mathematics Learning Outcomes for Experimental Group 1 and Experimental Group 2

Students' Mathematics Learning Outcomes		
Descriptive Analysis	**TSTS**	**NHT**
N	26	26
Mean	**83,6538**	**76,1538**
Std. Deviation	8,07932	9,39656
Variance	65,275	88,29
Minimum	67,00	60,00
Maximum	95,00	90,00

2. Inferential analysis

Inferential analysis is intended to test the difference hypothesis of treatment or differences between students' mathematics learning outcomes after applied cooperative learning model type TSTS, NHT, and STAD with the help of SPSS software version 20.0 through:

a. Prerequisites Test Analysis

Prior to conducting an inferential analysis to test the hypothesis that has been proposed in advance the test requirements analysis:

1. Test of Normality

Test Normality data using Kolmogorof-Smirnov statistics. Provided if the value of Sig. (2-tailed) > α = 0.05, then H0 is accepted. The results of the calculation of the normality of the complete data are seen in table 5 below.

Table 5. Test of Normality

Test of Normality					
	Group	Kolmogorov-Smirnov			
		Statistic	Df	Sig.	H_0
POSTTEST	TSTS	**0,105**	26	**0,200**	Accepted
	NHT	**0,167**	26	**0,061**	Accepted
	STAD	**0,145**	26	**0,168**	Accepted

Based on the results of the analysis on the line Kolmogorov-Smirnov Z at table 4.13 for posttest using cooperative learning model type TSTS obtained Kolmogorov-Smirnov value Z = 0.105 with Sig. (2-tailed) = 0.200> α = 0.05 then H0 is accepted, and for posttest with cooperative learning model of NHT type obtained value Kolmogorov-Smirnov Z = 0.167 Sig. (2-tailed) = 0.061> α = 0.05 then H0 is accepted, and for posttest with STAD type cooperative learning model obtained Kolmogorov-Smirnov value Z = 0.145 Sig. (2-tailed) = 0.168> α = 0.05 then H0 is accepted. With the acceptance of H0 from the three models of cooperative learning it can be concluded that the data is normally distributed.

2. Test of Homogeneity

Before performing an inferential analysis to test the hypothesis that has been proposed first tested the requirements analysis of the test of the similarity of variance based on Levene's test through hypothesis testing as follows:

H_0 : Data comes from populations that share the same

H_1 : Data comes from populations that do not share the same amount

Provided that the Levene test statistic > F (α, k-1, n-k) then H0 is rejected, in other words the data is not homogeneous. The H0 rejection criterion can also be seen by comparing the significance value with α used if the sig value < α then H0 is rejected. The results of the full statistical analysis are seen in Table 6 below.

Table 6. Result of Statistical Analysis of *Levene's Test* Posttest

Test of Homogeneity of Variances				
Post-Test				
Levene Statistic	df1	df2	Sig.	H_0
2,364	2	75	**0,101**	Accepted

Based on the results of the analysis of TestsLevene's in Table 4:14 obtained Levene statistic value = 2.364 with Sigsebesar 0.101> α = 0.05 then H0 accepted. With the acceptance of H0, it can be concluded that the data support the assumption that the mathematics learning outcomes of the three treatments taught by TSTS, NHT, and STAD models have the same (homogeneous) variance. Thus the use of One Way Anova Test using Equal Variance Assumed (assumed as the same variance).

b. Hypothesis Test

1. The statistical test used to see the difference of mathematics learning result between students taught by using cooperative learning type TSTS, NHT, and STAD then used One Way Anova formula. Through hypothesis testing as follows.

$H_0 : «_1 = «_2 = «_3$

$H_1 : «_i \neq «_j$ for at least a pair of i and j with *i, j* = 1,2,3 and $i \neq j$

Testing criterion is rejected, if sig value < α = 0.05. The results of the complete statistical analysis can be seen in Table 7 below.

Table 7. Result of Hypothesis Test 1 Using *One Way Anova*

ANOVA					
Posttest					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3046,641	2	1523,321	**13,427**	**0,000**
Within Groups	8509,154	75	113,455		
Total	11555,795	77			

Based on the results of hypothesis testing 1 in Table 7, obtained value of F_{count} = 13.427 with Sig. (2-tailed) = 0.000 < α = 0.05 then H0 is rejected and H1 is accepted. With the rejection of H0 it can be concluded that "There are differences in mathematics learning outcomes between students taught by using cooperative type TSTS, NHT, and STAD on students of Class VIII SMP Negeri 1 Kolaka"

2. To test the hypotheses 2, 3, and 4 then use Posteriori Test (Post Hoc) on Multiple Comparisons table.
   a. The statistical test used to see whether the average of mathematics learning outcomes of students taught by cooperative learning type TSTS is better than the average of mathematics learning outcomes of students who were taught with STAD type cooperative learning model, then used Scheffe test formula, through testing the following hypothesis:
   $$H_0 : «_1 \leq «_3 \text{ versus } H_1 : «_1 > «_3$$
   b. The statistic test used to see whether the average of mathematics learning result of students who taught by cooperative learning type NHT is better than the average of mathematics learning result of students who taught by cooperative learning type STAD, then used Scheffe test formula, through hypothesis testing as follows.
   $$H_0 : «_2 \leq «_3 \text{ versus } H_1 : «_2 > «_3$$
   c. The statistical test used to see whether the average of mathematics learning outcomes of students who are taught with cooperative learning type TSTS is better than the average of mathematics learning outcomes of students who were taught by cooperative learning type NHT, then used scheffe test formula, through hypothesis testing as follows.
   $$H_0 : «_1 \leq «_2 \text{ versus } H_1 : «_1 > «_2$$

Testing criterion is to reject H0, if sig value < α = 0.05. The result of statistical analysis can be seen in the following table 8.

Table 8. Result of Hypothesis Test 2, 3, and 4 Using *Scheffe Test*

Multiple Comparisons						
Dependent Variable: Posttest						
Scheffe						
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
TSTS	NHT	7,50000	2,95421	**0,045**	0,1220	14,8780
	STAD	15,30769	2,95421	**0,000**	7,9297	22,6857
NHT	TSTS	-7,50000	2,95421	0,045	0-14,8780	0-,1220
	STAD	7,80769	2,95421	**0,035**	0,4297	15,1857
STAD	TSTS	-15,30769	2,95421	0,000	-22,6857	0-7,9297
	NHT	-7,80769	2,95421	0,035	-15,1857	0-,4297

   a. Based on the results of testing hypothesis 2 in table 8, obtained value Mean Difference (I-J) of 15.30769 * with Sig of 0.000 < α = 0.05 then H0 is rejected and H1 is accepted. With the rejection of H0, it can be concluded that "The average of mathematics learning outcomes of students who are taught with cooperative learning type TSTS is better than the average of mathematics learning outcomes of students who were taught by STAD type"**.**
   b. Based on the result of testing of hypothesis 3 in table 8, the value of Mean Difference (I-J) is 7,80769 * with Sig equals = 0.035 < α = 0.05 then H0 is rejected and H1 is accepted. With the rejection of H0, it can be concluded that "The average of mathematics learning outcomes of students who were taught by cooperative learning type NHT is better than

the average of mathematics learning outcomes of students who were taught by type STAD"*.*

Based on the results of hypothesis 4 test on table 8, the value of Mean Difference (IJ) is 7.50000 * with Sig = 0.045 < α = 0.05 then H0 is rejected and H1 isaccepted. With H0 rejection, it can be concluded that "Average learning outcomes of students who taught with cooperative learning TSTS type is better than the average of mathematics learning outcomes of students taught by NHT type "*.*

Discussion

Results of Students' Mathematics Learning Taught with Cooperative Learning Model TSTS, NHT, and STAD.

Based on the results of the study, it was found that the students' learning outcomes taught using cooperative learning type TSTS, NHT, and STAD consisting of 78 students showed a minimum score of 34, a maximum value of 95, an average of 76.0513, a variance of 150,075, and a standard deviation of 12.25052.

The results of hypothesis testing 1 using One Way Anova test with Df = (2.75) obtained Fcount = 13.427 with sig value. 0.000 < α = 0.05 then H0 is rejected and H1 is accepted. Hypothesis testing with One Way Anova test shows that H0 is rejected, it means that there is significant difference among cooperative learning type TSTS, NHT, and STAD.

Results of Students' Mathematics Learning Taught with Cooperative Learning Model TSTS and STAD

Based on the results of the research, it was found that the students' learning outcomes were taught using cooperative learning model TSTS type, consisting of 26 students showing the minimum value of 67, the maximum value 95, the average 83.6538, the variance 65.275, and the standard deviation of 8.07932. While the students who were taught using STAD type cooperative learning consisting of 26 students showed a minimum score of 34, a maximum value of 95, an average of 68.3462 variance of 186,795, and standard deviation13.66731

The results of hypothesis 2 test using scheffe test with Mean Difference (IJ) of 15.30769 * while the sig value of 0.000 < α = 0.05 then H0 is rejected and H1 is accepted, this means that the average learning outcomes of students taught by cooperative learning type TSTS is better than the average of mathematics learning result of students who are taught by cooperative learning type STAD. This is because the cooperative learning type TSTS allows students to discuss with other groups, so that students can exchange information. This is supported by Shoimin (2014: 115) who stated that this type of TSTS cooperative learning guarantees the involvement of all students as well as individuals in group discussions, so as to encourage all group members to understand each material and work out the matter seriously so as to improve the learning achievement. This is in line with research conducted by Supratman (2014) shows that the results of learning mathematics students who are taught with cooperative learning type TSTS is better than the results of learning mathematics students who were taught by type STAD.

Results of Students' Mathematics Learning Taught with Cooperative Learning Type NHT and STAD

Based on the results of the study, it was found that descriptively the learning outcomes of students who were taught using NHT type cooperative learning, consisting of 26 students showed a minimum score of 60, a maximum value of 90, an average of 76.1538, a variance of 88.295, and a standard deviation of 9.39656. While students taught using STAD type cooperative learning consisting of 26 students showed a minimum score of 34, a maximum value of 95, an average of 68.3462, a variance of 186,795, and a standard deviation of 13.66731.

Result of hypothesis test 3 using Scheffe test with Mean Difference (IJ) equal to 7.80769* while sig value equal to 0.035 < α = 0.05 then H0 is rejected and H1 is accepted, this means that mean of mathematics learning result of student taught by cooperative learning type NHT is Better than the average of mathematics learning outcomes of students who were taught by STAD type cooperative learning. This is because in the NHT type of cooperative learning there is a numbering stage that encourages students to understand the material and do the problem seriously. The teacher will appoint a student to represent his group without telling them what number to call so students will be more confident. This is supported by Ibrahim (2000: 28) who stated that NHT type cooperative learning can emphasize on special structures designed to influence the interaction patterns of students and have a goal to improve academic mastery. This is in line with research conducted by Satriah (2012) which states that the results of

learning mathematics students who are taught by cooperative learning type NHT is better than the results of learning mathematics students who were taught by type STAD.

Results of Students' Mathematics Learning Taught with Cooperative Learning Model TSTS and NHT.

Based on the results of the research, it was found that the students' learning outcomes were taught using cooperative learning model TSTS type, consisting of 26 students showing the minimum value of 67, the maximum value 95, the average 83.6538, the variance 65.275, and the standard deviation of 8.07932. While students taught using NHT type cooperative learning consisting of 26 students showed a minimum score of 60, a maximum value of 90, an average of 76.1538, a variance of 88.29, and a standard deviation of 9.39656.

The result of hypothesis test 4 using schfect test with Mean Difference (IJ) of 7.50000 * while the sig value of 0.045 < α = 0.05 then H0 is rejected and H1 is accepted, this means that the average of mathematics learning result of students who are taught by cooperative learning type TSTS is better than the average of mathematics learning outcomes of students who were taught with NHT type.

The results of this study are in line with research conducted by Anies (2011) which concludes that cooperative learning type TSTS provides better mathematics learning achievement than cooperative learning type NHT.

E. Conclusion

1. The average of grade VIIID students' learning outcomes taught using cooperative learning type TSTS consisting of 26 students showed minimum score 67, maximum score 95, average 83.6538, with variance 65.275, and standard deviation 8.07932.
2. The average of grade VIIIF students' mathematics learning outcomes taught using NHT type cooperative learning model consisting of 26 students showed a minimum score of 60, a maximum value of 90, a mean of 76.1538, with a variance of 88.29, and a standard Deviation of 9.39656.
3. The average of mathematics learning outcomes of grade VIIIH students who were taught using STAD type cooperative learning consisting of 26 students showed a minimum score of 34, a maximum value of 95, an average of 68.3462, with a variance of 186,795, and a standard deviation of 13.66731.
4. There are differences in mathematics learning outcomes between students taught using cooperative learning type TSTS, NHT, and STAD.
5. Results of mathematics learning of students who were taught by cooperative learning type TSTS is better than the results of learning mathematics students who were taught by type STAD.
6. Results of mathematics learning of students who were taught by cooperative learning type NHT is better than the results of learning mathematics students who were taught by type STAD.
7. Results of mathematics learning of students who were taught by cooperative learning type TSTS is better than the results of learning mathematics students who were taught with the type of NHT.

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